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**Case Report**

# Good news: it's not a sarcoma but a lobular capillary hemangioma

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## ABSTRACT

Lobular capillary hemangioma (LCH), also known as pyogenic granuloma (PG), is a benign vascular tumor characterized by lobular proliferation of the capillaries that typically occurs in the head, neck, and oral mucosa. Occurrence in the extremities is uncommon and may mimic malignant soft tissue neoplasms. Although these masses can present at any age and in any race, with equal prevalence in men and women, they are more common in children, adolescents, young adults, and pregnant women. The diagnosis of LCH in atypical locations presents a challenge, particularly in young adults, due to the broad differential of both benign and malignant lesions with overlapping findings clinically and on imaging. Imaging with ultrasound or MRI may assist in characterizing the lesion, but it lacks specificity. Histopathological analysis remains the gold standard for diagnosis. Surgical excision serves diagnostic and therapeutic purposes, allowing for high resolution rates and low recurrence. We present the case of a 20-year-old male with a progressively enlarging soft tissue mass over the posterior right elbow, with magnetic resonance imaging raising initial concern for a soft tissue sarcoma. Surgical excision and histopathological analysis confirmed the diagnosis of LCH. This case underscores the importance of including benign vascular lesions such as LCH in the differential diagnosis of soft tissue masses, particularly in young adults.

**Keywords:** Lobular capillary hemangioma, Pyogenic granuloma, Granuloma gravidarum, Granuloma of pregnancy, Epulis gravidarum, Benign vascular tumor, Extremity mass

## INTRODUCTION

Lobular capillary hemangioma (LCH) is a noncancerous tumor consisting of abnormal blood vessels. LCH can be found anywhere in the body; however, the most common sites include the nose, lips, mouth, and skin. LCH can affect people of all ages, races, and sexes. They are more common in children, teenagers, young adults, and pregnant women. In pregnant women, they are called granuloma gravidarum, granuloma of pregnancy, or epulis gravidarum. LCH are also known as PG, which is a misnomer as they are rarely related to infection and generally do not contain white blood cells or purulent material. The evaluation of soft tissue masses in young adults presents a significant diagnostic challenge due to the broad differential, which spans from benign entities like ganglion cysts and lipomas to malignant tumors like soft tissue sarcomas.[1]

A study of 325 cases found that cutaneous lesions accounted for 86% of LCH, with equal prevalence in male and female patients, typically presenting in the second decade of life, with common sites including the trunk, upper extremities, and head.[2] We present a case of a 20-year-old male with a progressively enlarging soft tissue mass located over the posterior aspect of the right elbow overlying the olecranon. Subsequent surgical excision and histopathologic analysis established the diagnosis of LCH.

## CASE REPORT

A 20-year-old male presented to the emergency department with a progressively enlarging mass over his right elbow for two months. The patient denied fever, redness, warmth, or drainage from the area. He was uncertain about the initial onset and could not recall any preceding trauma or injury. On examination, there was a 4×4 cm soft, mobile mass in the right elbow area that was non-tender to palpation and had no signs of warmth, erythema, or infection. The overlying skin was intact without erythema, warmth, or induration. The neurovascular status of the extremity was intact.

An X-ray of the right elbow revealed no acute osseous abnormalities. An ultrasound revealed a 4.16×3.66×2.14 cm bulbous, hypervascular mass with echogenicity similar to muscle fibers, posterior to the proximal ulna beneath the olecranon process. An MRI demonstrated an enhancing soft tissue mass raising concern for a neoplasm, potentially a sarcoma involving the subcutaneous tissues at the level of the proximal ulna metaphysis. The mass was ovoid and measured 4.0×3.4×1.8 cm. The ulnar nerve was normal and within the cubital tunnel. Mass excision was performed under monitored anesthesia care and local sedation. Histologic examination showed a multinodular growth pattern composed primarily of capillary-type vessels, with areas of solid growth and anastomosing vascular channels. The small vascular lumina were lined by flat or cuboidal endothelial cells without evidence of pleomorphism or increased mitotic activity. At the periphery of the lesion, larger and more mature blood vessels were also identified, confirming the benign nature of the mass.

The patient was seen in the clinic 10 days postoperatively with no complaints. The wound was healing well, with no signs of infection or bleeding. Sutures were removed, and Steri-Strips were applied to support continued wound healing. The patient was instructed to return in one month for a final postoperative evaluation but was subsequently lost to follow-up.

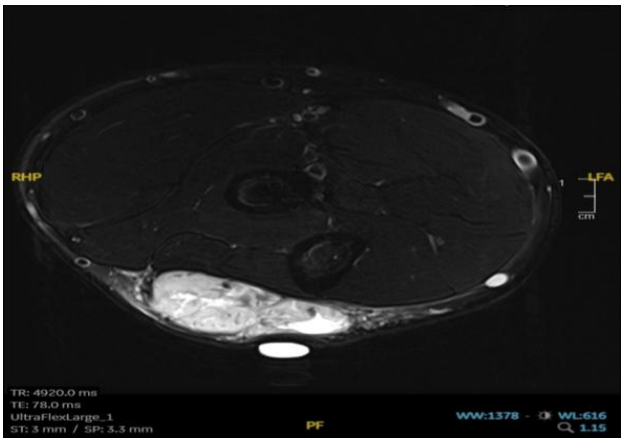


**Figure 1: MRI T2-weighted axial slice of enhancing soft tissue mass.**

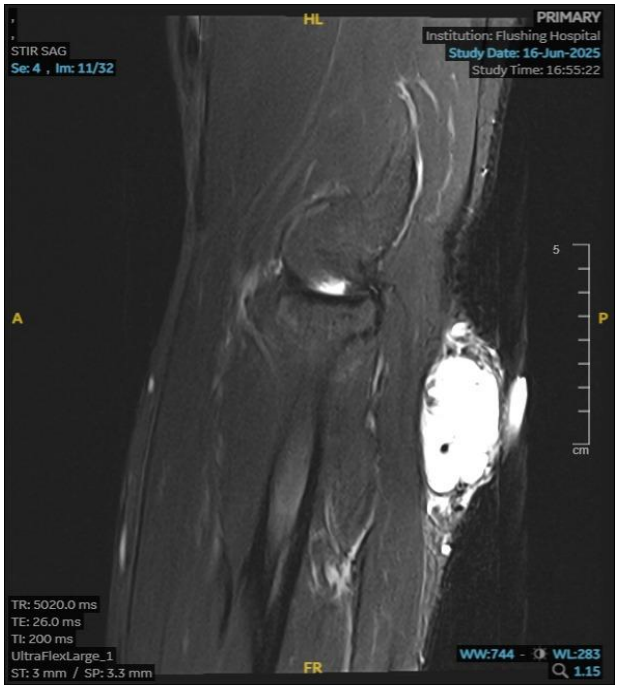


**Figure 2: MRI STIR sagittal slice of enhancing soft tissue mass.**

## DISCUSSION

The correct evaluation and diagnosis of soft tissue masses in young adults presents quite a significant challenge.[1] While many studies exist, most studies report common sites to include the scalp, face, and oral cavity. Only limited case studies can be found on LCH s that present in less common areas like the trunk and upper or lower extremities. One differential that is worth mentioning for such uncommon locations is a solitary skeletal hemangioma. In a study by Kaleem et al a case was described of a 70-year-old man with a diagnosis of prostate carcinoma who presented with increased radionuclide uptake in a lesion on the distal humerus following a scan. The lesion was histologically diagnosed to be a capillary hemangioma, with the patient remaining asymptomatic at a follow-up 41 months later. It is rarely diagnosed correctly before surgery because its radiologic patterns are very diverse, but it is an important differential to keep in mind.[3]

LCH can occur in various locations throughout the body across all age groups and may present without an identifiable cause. An extensive epidemiologic analysis encompassing 325 documented cases of LCH found that cutaneous lesions accounted for 86% of cases, whereas mucosal lesions comprised only 12% of cases.[4] Cutaneous LCHs demonstrated equal prevalence in male and female patients and typically presented in the second decade of life, with common sites including the trunk, upper extremities, and head.[4] In contrast, mucosal lesions, particularly those located on the lips, gingiva, and tongue, were twice as common in females, a finding potentially related to hormonal influences, such as during pregnancy,

leading to the term "pregnancy tumor".[4] Koo et al described 155 patients with LCH; the most frequent locations were the face (n=47), the finger (n=35), and the scalp (n=19); 14% of their patients had a history of trauma at the location of the lesion, but 78% had no known etiology.[5]

Clinically, bleeding and pain can occur, but most often these hemangiomas will present without any symptoms. One study reported that 66% presented with no symptoms, 26% presented with bleeding at the lesion, and 8% presented with pain at the lesion.[5] LCH or PG diagnosis can be challenging due to a similar appearance to other types of lesions. Differentials should include nevi, fibrokeratomas, and malignancies, including basal and squamous cell carcinoma.[6] A case study of a biopsied lesion that resembled PG turned out to be cutaneous metastases of renal cell carcinoma.[7] LCH is a complex mass showing a "distinctive capillary arrangement with plump endothelial cells and notable mitotic activity".[6]

Imaging modalities, including ultrasound (US) and magnetic resonance imaging (MRI), are essential for characterizing lesion features, determining anatomical relationships, and assessing vascularity. Ultrasound is often the initial imaging modality due to its accessibility and ability to assess superficial lesions. Findings on ultrasound that suggest LCH include an ill-defined, oval, vascular subcutaneous nodule without calcifications, especially when the nodule is associated with pain or bleeding.[8] MRI provides superior soft tissue contrast and spatial resolution for deeper or more complex lesions.[1,9] MRI will show a hypointense lesion on non-contrast images and peripheral enhancement with contrast. Angiography can also be used and would show a hypervascularized mass.[9] Imaging findings can overlap with techniques lacking specificity in distinguishing benign from malignant tumors.[1,10] Consequently, histopathologic examination via biopsy remains the gold standard for establishing a definitive diagnosis and guiding appropriate clinical management.[1,10]

Treatment modalities for LCH s include complete excision, laser ablation, electrodessication, medication, or observation. A review of 3 studies including 454 patients showed that surgical excision of LCH, especially intraoral, head and neck, upper extremity, or finger, resulted in 98% resolution after one session.[6] Another meta-analysis with data from 21 studies showed that 68.2% of patients achieved complete resolution when looking at all treatments.[6] Resolution rates did not change relative to the location of the lesions. This also showed that surgical excision was the most effective treatment, with 96.2% of patients achieving resolution.[6]

Recurrences can occur, and in the study of Koo et al 7% (n=12/155) relapsed following treatment. The recurrence was broken down to include 6 patients after laser ablation and 4 patients after surgical excision. Of note, electrodessication did not have any recurrences, but this was not statistically significant due to the small number of cases.[5]

## CONCLUSION

LCH are rare in the extremities and can clinically and radiographically simulate malignant soft tissue neoplasms. In the present case, the rapid enlargement of the lesion and MRI findings of an enhancing soft tissue mass initially raised concern for a sarcoma. Definitive diagnosis was established through histopathologic examination, which revealed a benign lobular proliferation of capillaries without cytologic atypia or increased mitotic activity. Surgical excision remains the treatment of choice, serving both to confirm the diagnosis and to prevent potential local complications or recurrence. This case highlights the importance of including benign vascular tumors in the differential diagnosis of soft tissue masses, particularly in young adults.

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